

1. Record Nr.	UNISA996201771203316
Titolo	2006 IEEE International Symposium on Industrial Electronics : Montréal, Québec, Canada : 9-13 July 2006
Pubbl/distr/stampa	[Place of publication not identified], : IEEE, 2006
ISBN	1-5090-9092-4 1-4244-0497-5
Disciplina	670.42
Soggetti	Industrial electronics - Automation Manufacturing processes Power electronics Electronic control Electrical & Computer Engineering Engineering & Applied Sciences Electrical Engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph

2. Record Nr.	UNINA9910139093203321
Autore	Kruger Uwe, Dr.
Titolo	Statistical monitoring of complex multivariate processes [[electronic resource]] : with applications in industrial process control / / Uwe Kruger and Lei Xie
Pubbl/distr/stampa	Chichester [England] ; ; Hoboken, N.J., : Wiley, 2012
ISBN	1-283-54977-8 9786613862228 0-470-51725-5 0-470-51724-7 1-118-38126-2
Edizione	[1st edition]
Descrizione fisica	1 online resource (472 p.)
Collana	Statistics in practice
Classificazione	MAT029020
Altri autori (Persone)	XieLei
Disciplina	519.5/35
Soggetti	Multivariate analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Machine generated contents note: Preface Introduction I Fundamentals of Multivariate Statistical Process Control 1 Motivation for Multivariate Statistical Process Control 1.1 Summary of Statistical Process Control 1.1.1 Roots and Evolution of Statistical Process Control 1.1.2 Principles of Statistical Process Control 1.1.3 Hypothesis Testing, Type I and II errors 1.2 Why Multivariate Statistical Process Control 1.2.1 Statistically Uncorrelated Variables 1.2.2 Perfectly Correlated Variables 1.2.3 Highly Correlated Variables 1.2.4 Type I and II Errors and Dimension Reduction 1.3 Tutorial Session 2 Multivariate Data Modeling Methods 2.1 Principal Component Analysis 2.1.1 Assumptions for Underlying Data Structure 2.1.2 Geometric Analysis of Data Structure 2.1.3 A Simulation Example 2.2 Partial Least Squares 2.2.1 Assumptions for Underlying Data Structure 2.2.2 Deflation Procedure for Estimating Data Models 2.2.3 A Simulation Example 2.3 Maximum Redundancy Partial Least Squares 2.3.1 Assumptions for Underlying Data Structure 2.3.2 Source Signal Estimation 2.3.3 Geometric Analysis of Data Structure 2.3.4 A Simulation Example 2.4 Estimating the Number of Source Signals 2.4.1 Stopping Rules for PCA Models 2.4.2 Stopping Rules for PLS Models 2.5

Tutorial Session 3 Process Monitoring Charts 3.1 Fault Detection 3.1.1 Scatter Diagrams 3.1.2 Nonnegative Quadratic Monitoring Statistics 3.2 Fault Isolation and Identification 3.2.1 Contribution Charts 3.2.2 Residual-Based Tests 3.2.3 Variable Reconstruction 3.3 Geometry of Variable Projections 3.3.1 Linear Dependency of Projection Residuals 3.3.2 Geometric Analysis of Variable Reconstruction 3.4 Tutorial Session II Application Studies 4 Application to a Chemical Reaction Process 4.1 Process Description 4.2 Identification of a Monitoring Model 4.3 Diagnosis of a Fault Condition 5 Application to a Distillation Process 5.1 Process Description 5.2 Identification of a Monitoring Model 5.3 Diagnosis of a Fault Condition III Advances in Multivariate Statistical Process Control 6 Further Modeling Issues 6.1 Accuracy of Estimating PCA Models 6.1.1 Revisiting the Eigendecomposition of Sz0z0 6.1.2 Two Illustrative Examples 6.1.3 Maximum Likelihood PCA for Known Sgg 6.1.4 Maximum Likelihood PCA for Unknown Sgg 6.1.5 A Simulation Example 6.1.6 A Stopping Rule for Maximum Likelihood PCA Models 6.1.7 Properties of Model and Residual Subspace Estimates 6.1.8 Application to a Chemical Reaction Process - Revisited 6.2 Accuracy of Estimating PLS Models 6.2.1 Bias and Variance of Parameter Estimation 6.2.2 Comparing Accuracy of PLS and OLS Regression Models 6.2.3 Impact of Error-in-Variables Structure upon PLS Models 6.2.4 Error-in-Variable Estimate for Known See 6.2.5 Error-in-Variable Estimate for Unknown See 6.2.6 Application to a Distillation Process - Revisited 6.3 Robust Model Estimation 6.3.1 Robust Parameter Estimation 6.3.2 Trimming Approaches 6.4 Small Sample Sets 6.5 Tutorial Session 7 Monitoring Multivariate Time-Varying Processes 7.1 Problem Analysis 7.2 Recursive Principal Component Analysis 7.3 MovingWindow Principal Component Analysis 7.3.1 Adapting the Data Correlation Matrix 7.3.2 Adapting the Eigendecomposition 7.3.3 Computational Analysis of the Adaptation Procedure 7.3.4 Adaptation of Control Limits 7.3.5 Process Monitoring using an Application Delay 7.3.6 MinimumWindow Length 7.4 A Simulation Example 7.4.1 Data Generation 7.4.2 Application of PCA 7.4.3 Utilizing MWPCA based on an Application Delay 7.5 Application to a Fluid Catalytic Cracking Unit 7.5.1 Process Description 7.5.2 Data Generation 7.5.3 Pre-analysis of Simulated Data 7.5.4 Application of PCA 7.5.5 Application of MWPCA 7.6 Application to a Furnace Process 7.6.1 Process Description 7.6.2 Description of Sensor Bias 7.6.3 Application of PCA 7.6.4 Utilizing MWPCA based on an Application Delay 7.7 Adaptive Partial Least Squares 7.7.1 Recursive Adaptation of Sx0x0 and Sx0y0 7.7.2 MovingWindow Adaptation of Sv0v0 and Sv0y0 7.7.3 Adapting The Number of Source Signals 7.7.4 Adaptation of the PLS Model 7.8 Tutorial Session 8 Monitoring Changes in Covariance Structure 8.1 Problem Analysis 8.1.1 First Intuitive Example 8.1.2 Generic Statistical Analysis 8.1.3 Second Intuitive Example 8.2 Preliminary Discussion of Related Techniques 8.3 Definition of Primary and Improved Residuals 8.3.1 Primary Residuals for Eigenvectors 8.3.2 Primary Residuals for Eigenvalues 8.3.3 Comparing both Types of Primary Residuals 8.3.4 Statistical Properties of Primary Residuals 8.3.5 Improved Residuals for Eigenvalues 8.4 Revisiting the Simulation Examples in Section 8.1 8.4.1 First Simulation Example 8.4.2 Second Simulation Example 8.5 Fault Isolation and Identification 8.5.1 Diagnosis of Step-Type Fault Conditions 8.5.2 Diagnosis of General Deterministic Fault Conditions 8.5.3 A Simulation Example 8.6 Application Study to a Gearbox System 8.6.1 Process Description 8.6.2 Fault Description 8.6.3 Identification of a Monitoring Model 8.6.4 Detecting a Fault Condition 8.7 Analysis of Primary and Improved Residuals 8.7.1 Central Limit Theorem 8.7.2 Further Statistical Properties of Primary Residuals 8.7.3 Sensitivity of

Statistics based on Improved Residuals 8.8 Tutorial Session IV
Description of Modeling Methods 9 Principal Component Analysis 9.1
The Core Algorithm 9.2 Summary of the PCA Algorithm 9.3 Properties
of a PCA Model 10 Partial Least Squares 10.1 Preliminaries 10.2 The
Core Algorithm 10.3 Summary of the PLS Algorithm 10.4 Properties of
PLS 10.5 Properties of Maximum Redundancy PLS References Index.

Sommario/riassunto

"The book summarises recent advances in statistical-based process
monitoring of complex multivariate process systems"--
